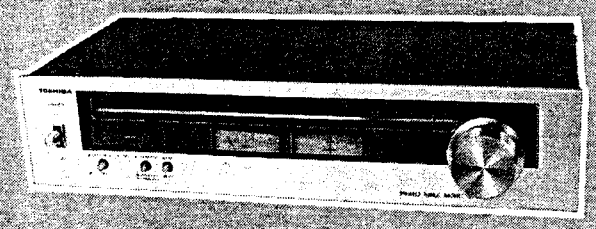
SERVICE DATA
FILE NO.170-057

TOSHIBA

STEREO TUNER

ST-335



SPECIFICATIONS

FM Tuner Section	
Receiving Frequency:	88 ~ 108 MHz
Sensitivity (IHF):	2.0μV
Harmonic Distortions:	MONO 0.2%
	STEREO 0.4%
S/N (IHF A Network):	MONO 73 dB
	STEREO 65 dB
Frequency Response:	30 ~ 15 kHz ±1 dB
Selectivity (IHF):	60 dB
Image Rejection:	50 dB
IF Rejection:	80 dB
Capture Ratio:	1.0 dB
Spurious Response:	70 dB
AM Suppression:	45 dB
Stereo Separation:	40 dB (at 400 Hz)

AM Tuner Section	
Receiving Frequency:	525 ~ 1605 kHz
Sensitivity (S/N 20 dB):	300μV/m
Selectivity:	25 dB
Image Rejection:	40 dB
S/N:	45 dB
General	
Power Supply:	AC 220V, 50 Hz (Europe)
	AC 240V, 50 Hz (England)
Power Consumption:	9W
Weight:	3.4 kg
Dimensions (W x H x D):	420 x 96 x 257 (mm)

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1. OPERATING CONTROLS

FRONT VIEW

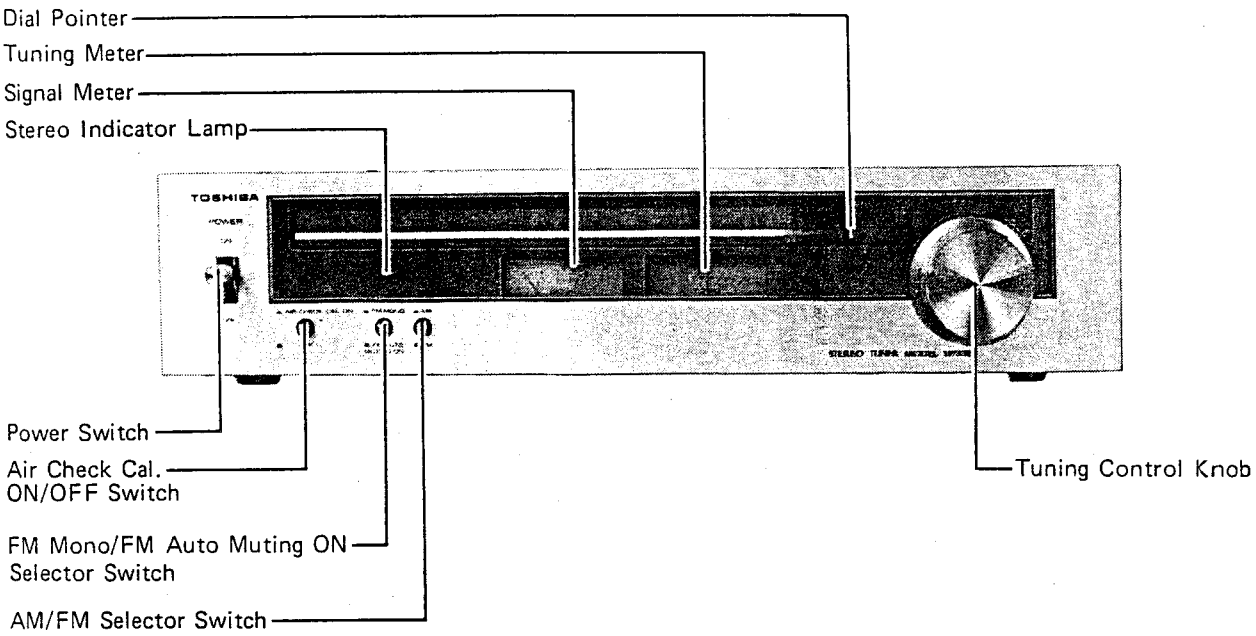


Figure 1.

REAR VIEW

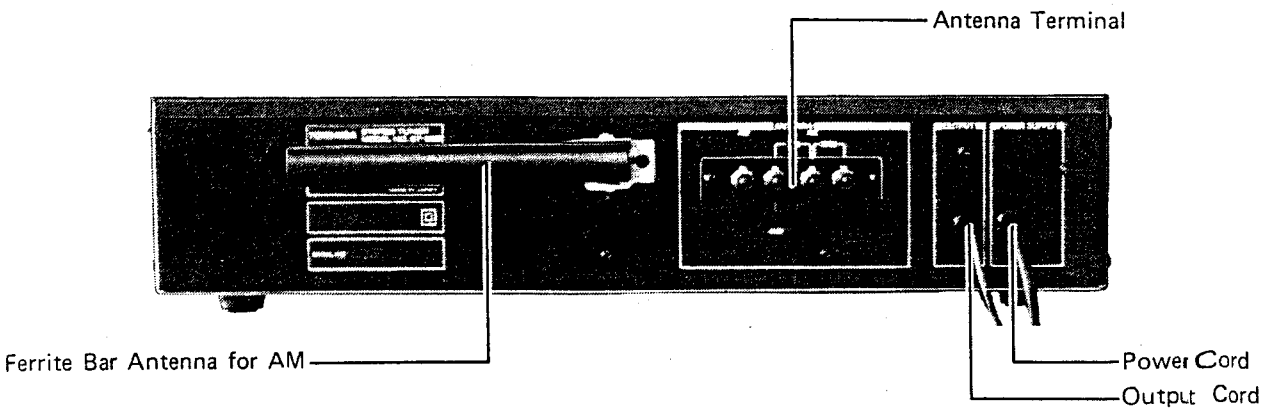


Figure 2.

2. DISASSEMBLY INSTRUCTIONS

TOP COVER REMOVAL

Remove four screws ① and 2 . See figure 3.

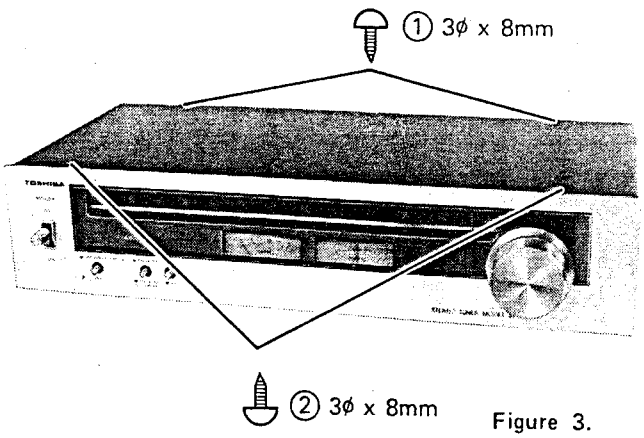


Figure 3.

BOTTOM COVER REMOVAL

Remove four screws ③. See figure 4.

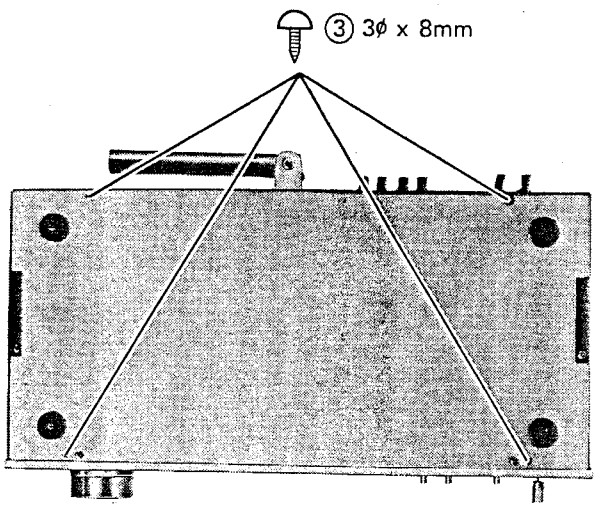


Figure 4.

FRONT PANEL REMOVAL

Remove the Top Cover and Bottom Cover. See figure 3 and 4.
Remove two knobs ④. See figure 5.
Remove two screws ⑤. See figure 5.

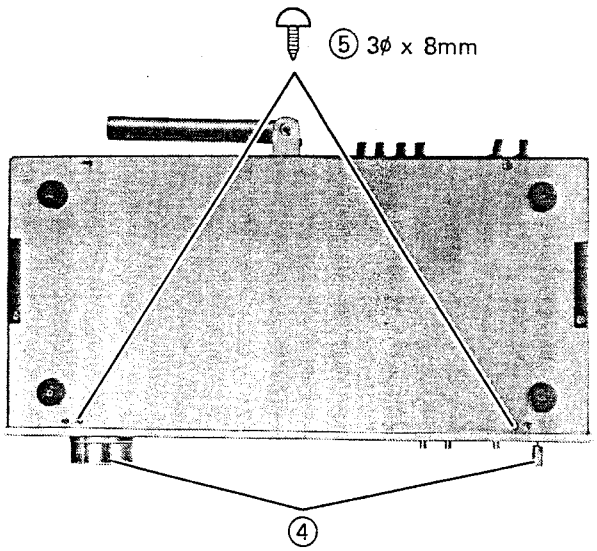


Figure 5.

3. BLOCK DIAGRAM

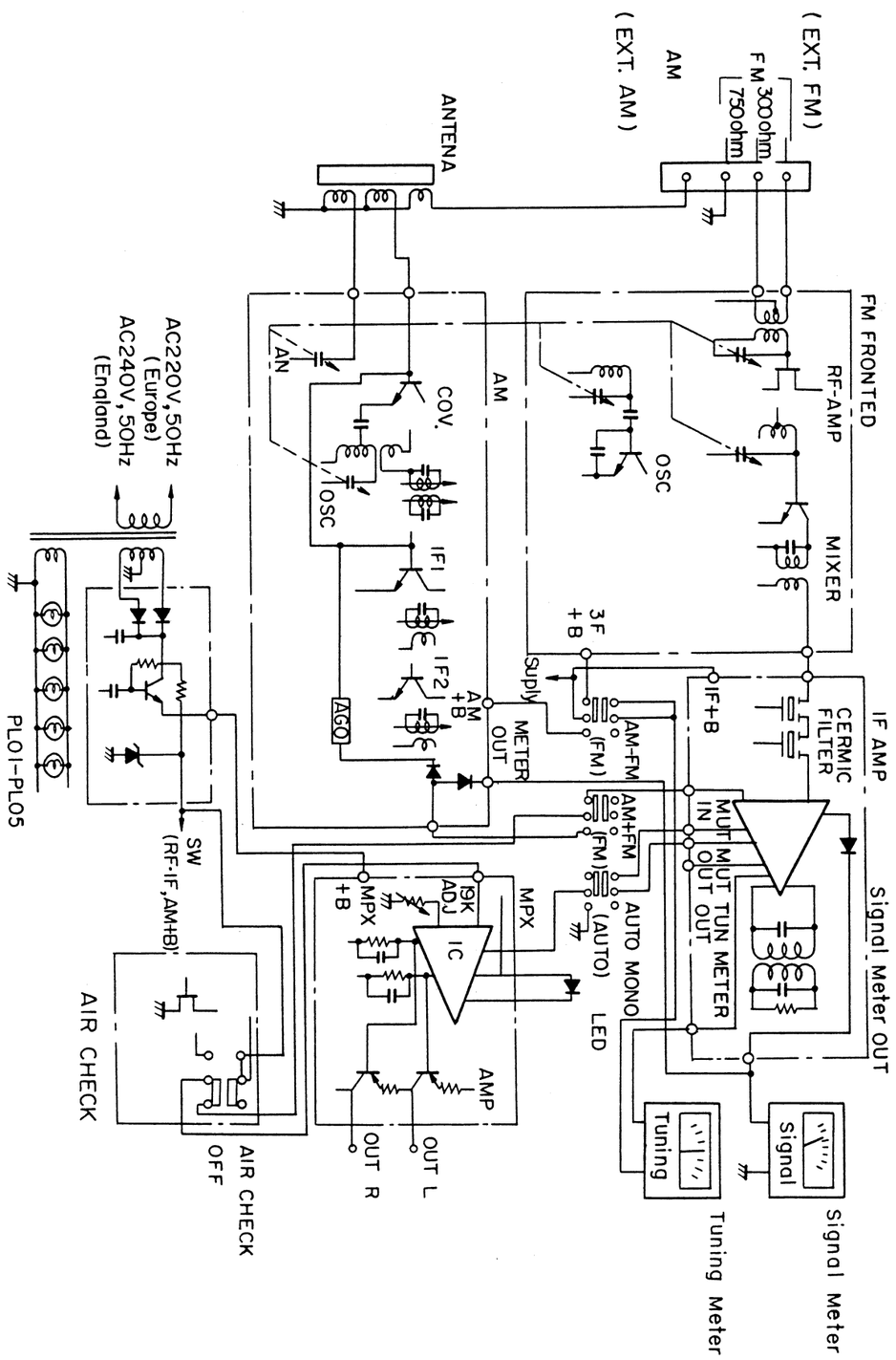
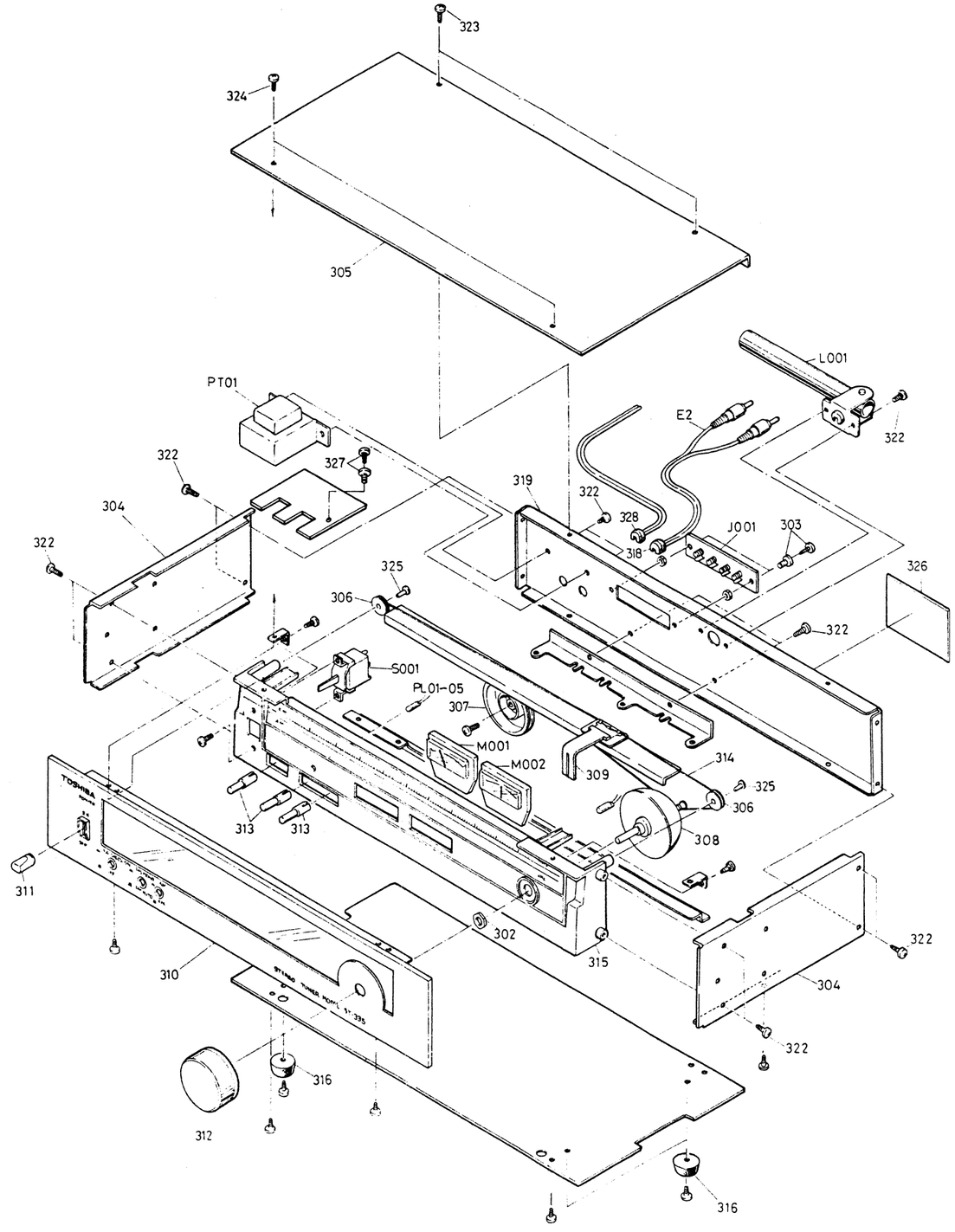


Figure 6.

4. CABINET PARTS LOCATIONS



5. ADJUSTMENT INSTRUCTIONS

ADJUSTING PARTS LOCATION

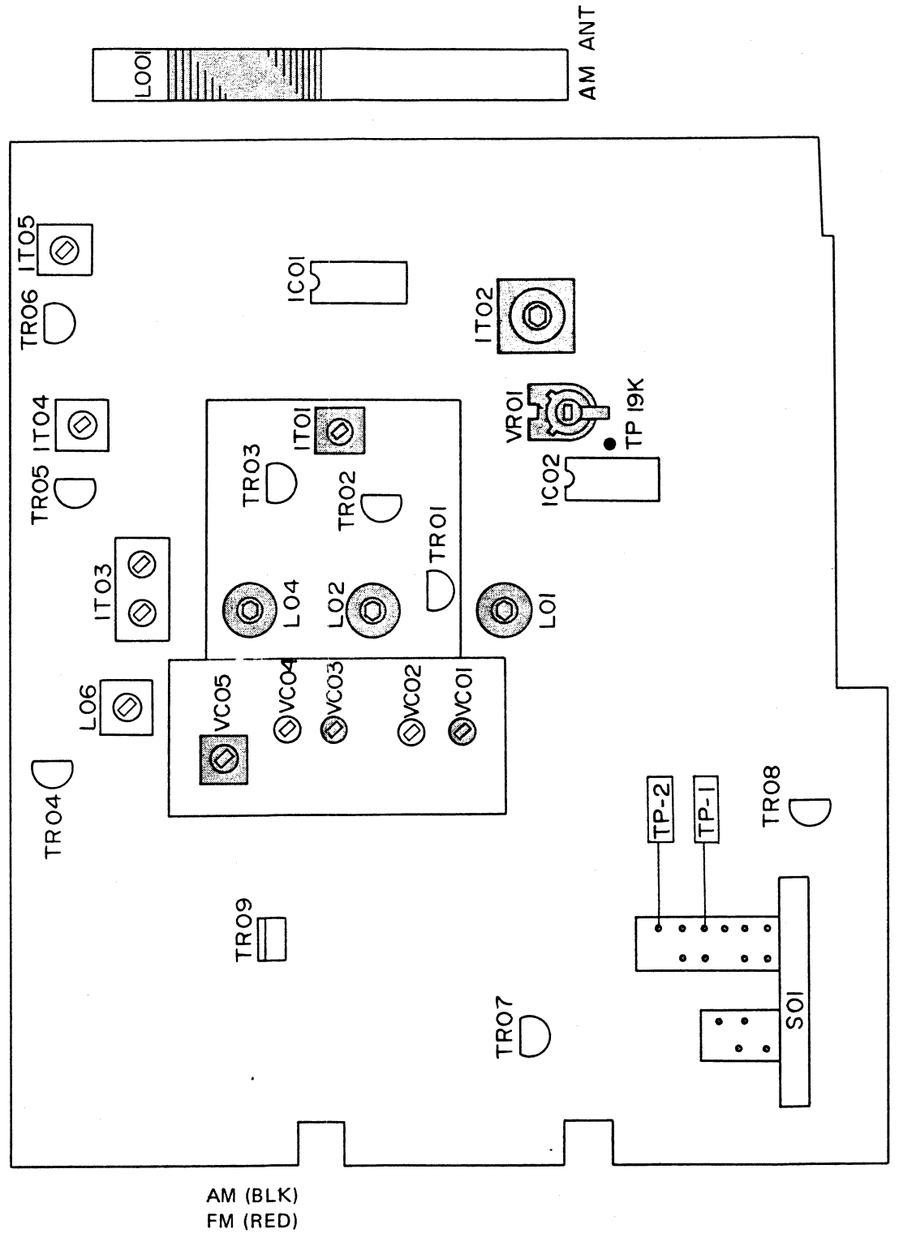


Figure 8.

AM ADJUSTMENT

Test equipments/Tools required

1. Signal generator
2. Sweep generator
3. Test loop antenna
4. VTVM
5. Adjusting screwdriver
6. Adjusting screwdriver (Use to antenna core)
7. Oscilloscope

IF ADJUSTMENT

Step	Adjustment	Remarks
IF Response	IT-03, IT-04, IT-05 IF Transformer	Adjust for scope pattern with specified marker (455 kHz) as illustrated in Fig.9

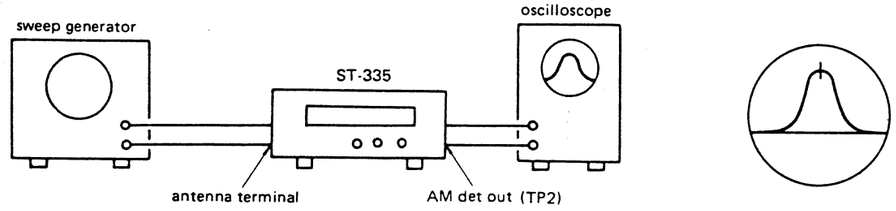


Figure 9.

FREQUENCY COVERAGE AND TRACKING ADJUSTMENT

Step	Adjusting Circuit	Connection		SG Frequency	Position of Tuning Dial	Adjustment	VTVM
		Input	Output				
1	OSC (Frequency Coverage)	Connect signal generator to test loop.	Connect VTVM to output terminal.	540 kHz (400 Hz 30% MOD.)		L06	Maximum
2				1600 kHz (400 Hz 30% MOD.)	Set the tuning gang	VC04	
Repeat steps 1 and 2.							
3	ANT (Tracking)	Connect signal generator to test loop.	Connect VTVM to output terminal.	600 kHz (400 Hz 30% MOD.)	Tune to 600 kHz signal	L001	Maximum
4				1400 kHz (400 Hz 30% MOD.)	Tune to 1400 kHz Signal	VC02	Maximum
Repeat steps 3 and 4.							

Note: When adjusting the AM tuner section, inductively connect the minimum input signal to the set.

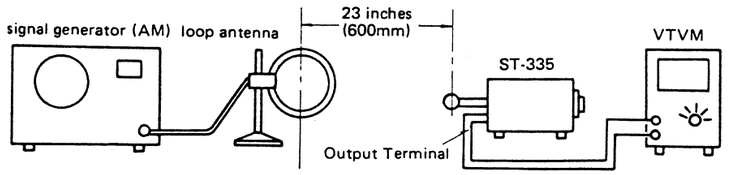


Figure 10.

FM ADJUSTMENT

Test equipments/Tools required

1. Sweep marker generator
2. Signal generator
3. Osilloscope
4. VTVM
5. FM dummy antenna (300 ohms)
6. Dummy load resistor
7. Network
8. Adjusting screwdriver
9. Adjusting bar

Step	Adjusting Circuit	Connection		SG Frequency	Position of Tuning Dial	Adjustment	VTVM
		Input	Output				
1	IF	Connect sweep generator to FM ANT. terminal (300 ohm)	Connect oscilloscope to TP1 (FM DET. OUT.).	10.7 MHz	Near max. capacity of VC. at position with no unrequired signal.	IT01 IT02 (Upper core only)	10.7 MHz 75 kHz 150 kHz
2	Radio Det.		Connect oscilloscope to TP1 (FM DET. OUT.)			IT02 (Lower core only)	75 kHz
3	OSC (Frequency coverage)	Connect FM signal generator to FM ANT. terminal (300 ohm)	Connect VTVM to output terminal.	87.5 MHz (400 Hz 30% MOD.)	Low end of dial scale	L04	Maximum
4				108 MHz (400 Hz 30% MOD.)	Set the tuning gang at 108 MHz.	TC5 Trimmer	
Repeat steps 3 and 4.							
5	RF	Connect FM signal generator to FM ANT. terminal.	Connect VTVM to output terminal.	88 MHz (400 Hz 30% MOD.)	Tune to 88 MHz signal.	L01 L02	Maximum
6				108 MHz (400 Hz 30% MOD.)	Tune to 108 MHz signal.	VC01 VC03	
Repeat steps 5 and 6.							

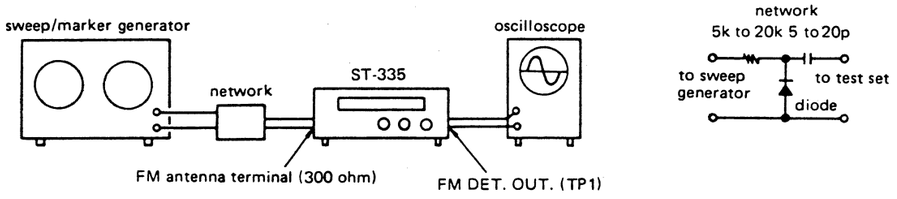


Figure 11.

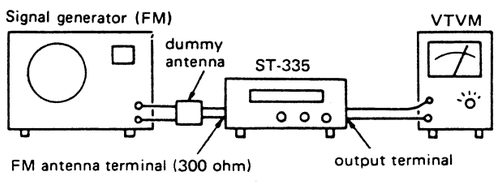


Figure 12.

CAUTION: When realigning the FM receiving frequency, the lowest side of the frequency range must not be below 87.5 MHz in order to comply with FTZ regulations in West Germany.

FM MPX ADJUSTMENTS

Test Equipments/Tools required

1. Frequency counter
2. Signal generator
3. Stereo modulator
4. VTVM
5. 300 ohm FM dummy antenna
6. Oscilloscope

Step	Procedure
Free-running frequency adjustment	Connect a frequency counter to the Test Point (TP) of IC02 (No.12pin), and adjust the VR01 for 19 kHz reading counter with no-signal input.

6. DIAL CORD RESTRINGING

STRINGING SEQUENCE

1. Wind the cord two times on the drum with the variable capacitors wings closed (tuning knob fully counter-clockwise).
2. Hook the cord on the pulley.
3. Wind the cord two times on the tuning shaft.
4. After stringing, make certain the cord is not overlaid by turning the tuning shaft.

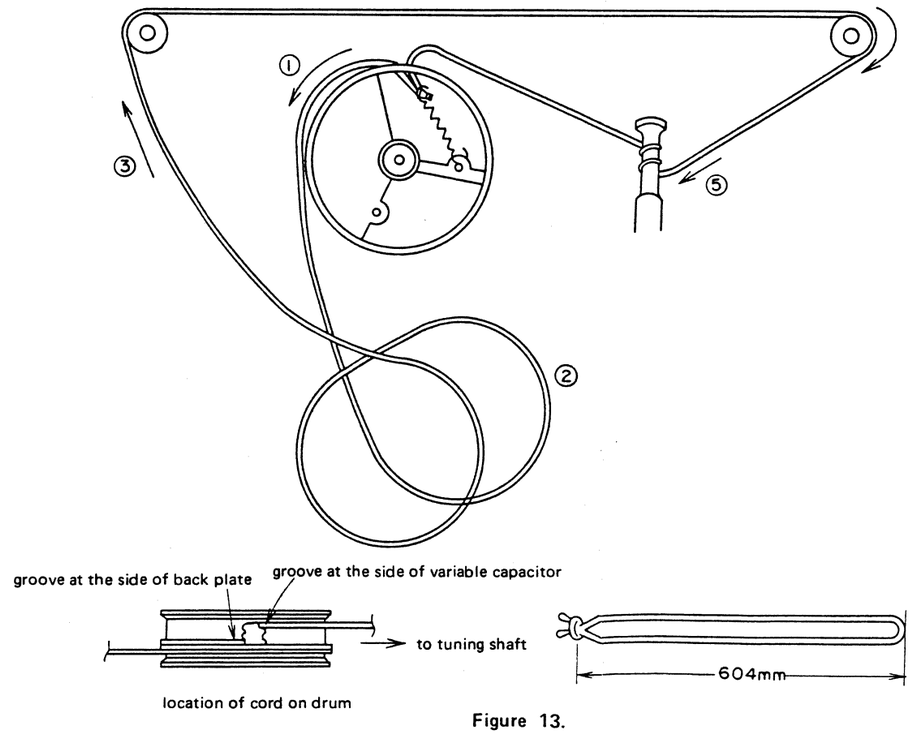


Figure 13.

7. SCHEMATIC DIAGRAM

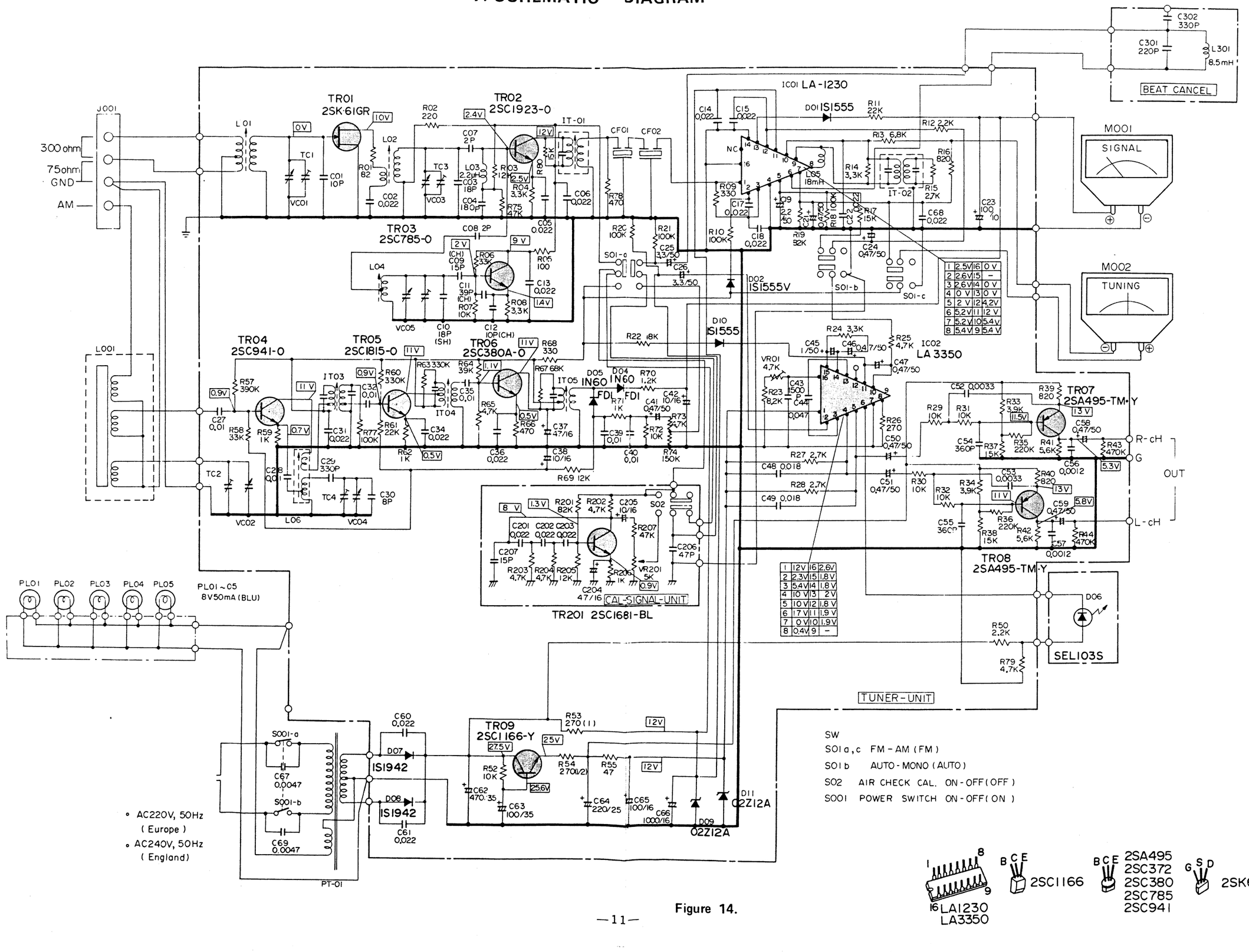
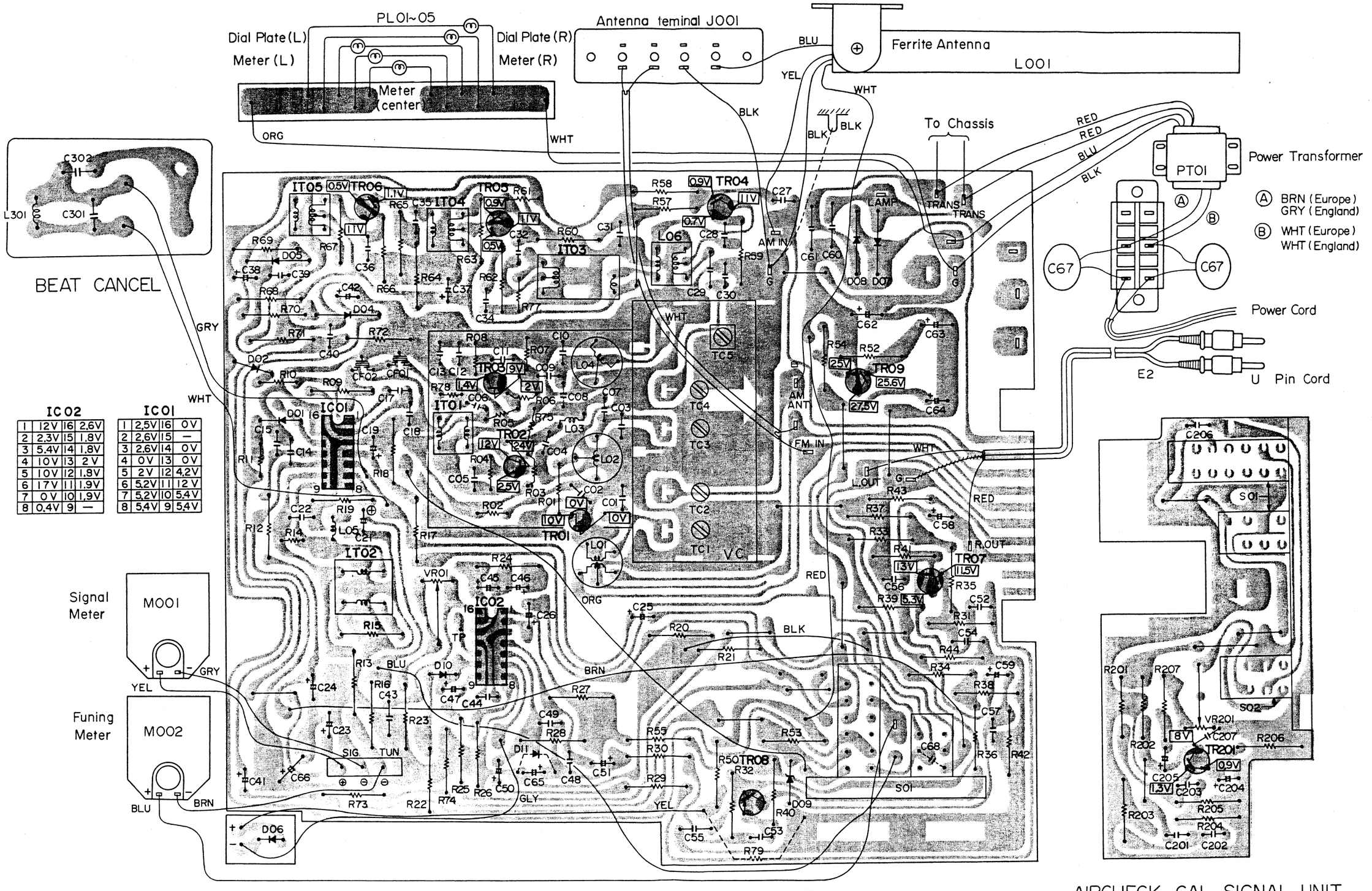


Figure 14.

8. ELECTRICAL PARTS LOCATIONS



IC02			
1	12V	16	2.6V
2	2.3V	15	1.8V
3	5.4V	14	1.8V
4	10V	13	2V
5	10V	12	1.9V
6	17V	11	1.9V
7	0V	10	1.9V
8	0.4V	9	—

IC01			
1	2.5V	16	0V
2	2.6V	15	—
3	2.6V	14	0V
4	0V	13	0V
5	2V	12	4.2V
6	5.2V	11	12V
7	5.2V	10	5.4V
8	5.4V	9	5.4V

Figure 15.

9. PARTS LIST

Symbol No.	Part No.	Description
		CABINET PARTS
301	20866009	Spring, Dial Drum
302	22702107	Nut, 9ø
303	22705022	Rivet, Plastic, 3ø x 5.5mm
304	22711450	Plate, Side
305	22711533	Plate, Top
306	22742099	Pulley, Dial
307	22742149	Drum
308	22749174	Tuning Shaft Ass'y
309	22749204	Pointer
310	22821364	Panel Ass'y
311	22824215	Knob, Power
312	22824216	Knob, Tuning
313	22824217	Knob
315	22719133	Dial Plate Ass'y
316	22874033	Leg
317	25764364	Washer
318	25845120	Bush, Cord
319	22711564	Plate, Jack
322	22701326	Screw, 3ø x 8mm
323	22701237	Screw, 3ø x 6mm
324	22707066	Screw, 3ø x 6mm
325	22743198	Shaft, Dial Pulley
326	22950773	Nameplate (England)
327	22705020	Rivet, Plate, 3ø x 4.5mm
328	25845528	Bush, Cord (Europe)
		TRANSISTORS, DIODE AND IC'S
TR01		Transistor, 2SK61-GR
TR02		Transistor, 2SC1923-O
TR03		Transistor, 2SC785-O.JA
TR04		Transistor, 2SC941-TM.O.JA
TR05		Transistor, 2SC1815-O
TR06		Transistor, 2SC380A-O-X.JA
TR07		Transistor, 2SA495-TM.Y
TR08		Transistor, 2SA495-TM.Y
TR09		Transistor, 2SC1627-Y
TR201		Transistor, 2SC1681-BL.JA
D01		Diode, 1S1555V
D02		Diode, 1S1555V
D04, 05		Diode, 1N60-FD1
D06		Diode, SEL103S
D07, 08		Diode, 1S1942
D09		Diode, 02Z12A
D10		Diode, 1S1555V
D11		Diode, 02Z12A
IC01	22114443	IC, LA1230
IC02	22114416	IC, LA3350
		ELECTRICAL PARTS
L01	22292078	Coil, FM
L02	22294294	Coil, FM
L03	22291082	Coil, RF Choke

Symbol No.	Part No.	Description
L04	22295062	Coil, FM
L05	22241036	Coil, RF Choke
L06	22245288	Coil, Oscillator
L001	22242642	Coil, Ferrite Antenna
L301	22211232	Coil, Choke
IT01	22265727	Transformer, IF
IT02	22265723	Transformer, IF
IT03	22264643	Transformer, IF
IT04	22264462	Transformer, IF
IT05	22266326	Transformer, IF
J001	22162278	Terminal, Antenna
M001	22104383	Meter, Signal
M002	22104382	Meter, Tuning
CF01, 02	22153028	Ceramic Filter
PL01, 02, 03, 04, 05	22113439	Lamp, 8V, 50mA
S01, 02	22195045	Switch, Push
S001	22195049	Switch, Lever, Power
PT01	22223169	Transformer, Power (Europe)
	22223170	Transformer, Power (England)
E1	22176286	Cord, Power (Europe)
	22217356	Cord, Power (England)
E2	22170352	Cord, US PIN
		CAPACITORS
		J = ±5%, K = ±10%, D = ±0.5pF, M = ±20%, Z = –20 to +80%
C01	22361100	Ceramic, 10pF, 50V, J
C02	22342223	Ceramic, 0.022mfd, 50V, Z
C03	22361180	Ceramic, 18pF, 50V, J
C04	22362181	Ceramic, 180pF, 50V, K
C05	22342223	Ceramic, 0.022mfd, 50V, Z
C06	22342223	Ceramic, 0.022mfd, 50V, Z
C07	22361209	Ceramic, 2pF, 50V, D
C08	22361209	Ceramic, 2pF, 50V, D
C09	22360131	Ceramic, 10pF, 50V, J
C10	22360153	Ceramic, 18pF, 50V, J
C11	22360137	Ceramic, 39pF, 50V, J
C12	22360131	Ceramic, 10pF, 50V, J
C13	22342223	Ceramic, 0.01mfd, 50V, Z
C14	22342223	Ceramic, 0.022mfd, 50V, Z
C15	22342223	Ceramic, 0.022mfd, 50V, Z
C17	22342223	Ceramic, 0.022mfd, 50V, Z
C18	22342223	Ceramic, 0.022mfd, 50V, Z
C19	22448229	Electrolytic, 2.2mfd, 50V
C21	22448478	Electrolytic, 0.47mfd, 50V
C22	22342223	Ceramic, 0.022mfd, 50V, Z
C23	22443101	Electrolytic, 100mfd, 16V
C24	22448478	Electrolytic, 0.47mfd, 50V
C25	22448339	Electrolytic, 3.3mfd, 50V
C26	22448339	Electrolytic, 3.3mfd, 50V
C27	22342103	Ceramic, 0.01mfd, 50V, Z
C28	22372103	Mylar, 0.01mfd, 50V, K
C29	22321049	Polypropylene, 330pF, 50V, J

Symbol No.	Part No.	Description
C30	22361809	Ceramic, 8pF, 50V, Z
C31	22342223	Ceramic, 0.022mfd, 50V, Z
C32	22342103	Ceramic, 0.01mfd, 50V, Z
C34	22342223	Ceramic, 0.022mfd, 50V, Z
C35	22342103	Ceramic, 0.01mfd, 50V, Z
C36	22342223	Ceramic, 0.022mfd, 50V, Z
C37	22445470	Electrolytic, 47mfd, 16V
C38	22445100	Electrolytic, 10mfd, 16V
C39	22372103	Mylar, 0.01mfd, 50V, K
C40	22372103	Mylar, 0.01mfd, 50V, K
C41	22448478	Electrolytic, 0.47mfd, 50V
C42	22445100	Electrolytic, 10mfd, 16V
C43	22321059	Polypropylene, 1500pF, 50V, J
C44	22372473	Mylar, 0.047mfd, 50V, K
C45	22448109	Electrolytic, 1mfd, 50V
C46	22448478	Electrolytic, 0.47mfd, 50V
C47	22448478	Electrolytic, 0.47mfd, 50V
C48, 49	22372183	Mylar, 0.018mfd, 50V, K
C50, 51	22448478	Electrolytic, 0.47mfd, 50V
C52, 53	22372332	Mylar, 0.0033mfd, 50V, K
C54, 55	22321016	Polypropylene, 1500pF, 50V, J
C56, 57	22371122	Mylar, 0.0012mfd, 50V, J
C58, 59	22448478	Electrolytic, 0.47mfd, 50V
C60, 61	22342223	Ceramic, 0.022mfd, 50V, Z
C62	22447471	Electrolytic, 470mfd, 35V
C63	22447101	Electrolytic, 100mfd, 35V
C64	22446221	Electrolytic, 220mfd, 25V
C65	22445101	Electrolytic, 100mfd, 16V
C66	22445102	Electrolytic, 1000mfd, 16V
C67	22340090	Ceramic, 0.0047mfd, 250V, Z
C68	22342223	Ceramic, 0.022mfd, 50V, Z
C69	22340090	Ceramic, 0.0047mfd, 250V, Z
C201	22372223	Mylar, 0.022mfd, 50V, K
C202	22372223	Mylar, 0.022mfd, 50V, K
C203	22372223	Mylar, 0.022mfd, 50V, K
C204	22445470	Electrolytic, 47mfd, 16V
C205	22445100	Electrolytic, 10mfd, 16V
C206	22361470	Ceramic, 47pF, 50V, J
C207	22362150	Ceramic, 15pF, 50V, K
C301	22362221	Ceramic, 220pF, 50V, K
C302	22362331	Ceramic, 330pF, 50V, K
VC01, 02, 03, 04, 05	22307353	Variable Capacitor
		RESISTORS
		Resistors are fixed carbon film ±5%, 1/4W, unless otherwise noted.
R01	22555820	82 ohm
R02	22555221	220 ohm
R03	22555123	12K ohm
R04	22555332	3.3K ohm
R05	22555101	100 ohm
R06	22555333	33K ohm

Symbol No.	Part No.	Description
R07	22555103	10K ohm
R08	22555332	3.3K ohm
R09	22545331	330 ohm
R10	22555104	100K ohm
R11	22555223	22K ohm
R12	22545222	2.2K ohm
R13	22545682	6.8K ohm
R14	22555332	3.3K ohm
R15	22545272	2.7K ohm
R16	22545821	820 ohm
R17	22545153	15K ohm
R18	22545104	100K ohm
R19	22545823	82K ohm
R20	22545104	100K ohm
R21	22545104	100K ohm
R22	22545183	18K ohm
R23	22545822	8.2K ohm
R24	22545332	3.3K ohm
R25	22545472	4.7K ohm
R26	22545271	270 ohm
R27, 28	22545272	2.7K ohm
R29, 30	22545103	10K ohm
R31, 32	22545103	10K ohm
R33, 34	22545392	3.9K ohm
R35, 36	22545224	220K ohm
R37, 38	22545153	15K ohm
R39, 40	22545821	820 ohm
R41, 42	22545562	5.6K ohm
R43, 44	22545474	470K ohm
R50	22545222	2.2K ohm
R52	22545103	10K ohm
R53	22570446	270 ohm, 1W, ±10%, Metal Oxided Film
R54	22563271	270 ohm, 1/2W, ±10%, Solid
R55	22545470	47 ohm
R57	22545394	390K ohm
R58	22545333	33K ohm
R59	22545102	1K ohm
R60	22545334	330K ohm
R61	22555223	22K ohm
R62	22545102	1K ohm
R63	22545334	330K ohm
R64	22545393	39K ohm
R65	22545472	4.7K ohm
R66	22545471	470 ohm
R67	22545683	68K ohm
R68	22545331	330 ohm
R69	22545123	12K ohm
R70	22545122	1.2K ohm
R71	22545102	1K ohm
R72	22545103	10K ohm
R73	22545472	4.7K ohm
R74	22545154	150K ohm

Symbol No.	Part No.	Description
R75	22545472	4.7K ohm
R77	22555104	100K ohm
R78	22555471	470 ohm
R79	22555472	4.7K ohm
R80	22545153	15K ohm
R001, 002	22563155	1.5M ohm, 1/2W, ±10%, Solid
R201	22545823	82K ohm
R202	22545472	4.7K ohm
R203	22545472	4.7K ohm
R204	22545472	4.7K ohm
R205	22545123	12K ohm
R206	22545102	1K ohm
R207	22545473	47K ohm
VARIABLE RESISTORS		
VR01	22658179	5K ohm, Semi-fixed
VR201	22658179	5K ohm, Semi-fixed
ACCESSORIES		
	22124452	Antenna Feeder Ass'y
	22902035	Owner's Manual